

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Johnnie R. Roberts et al.

Application No.: 09/916611

Confirmation No.: 8709

Filed: August 29, 2005

Art Unit: 1616

For: MANUFACTURE AND USE OF A
HERBICIDE FORMULATION

Examiner: A. N. Pryor

37 CFR 1.132 DECLARATION

1. I am one of the inventors of the above referenced application. I am employed by Helena Chemical Company as a Director of Product Development and Technical Services in Memphis, Tennessee. A copy of my most recent Curriculum Vitae is attached as Appendix A. In view of the above qualifications, I consider myself an expert in the field of agricultural compositions.

2. I have reviewed the office action which was mailed on November 30, 2004. The examiner has rejected the claims based on composition of AF-300. I have also reviewed and am familiar with AF-300 along with the above identified application.

3. The composition of AF-300 is found on their Material Safety Data Sheet ("MSDS"). MSDS sheet, dated January 2002 (see Appendix 1).

This MSDS sheet shows the following composition:

2,4-Dichlorophenoxy acetic acid at 300 grams per liter
Synthetic ethoxylated alcohol at 50%
Solvent 400 at 235 grams per liter.

4. The formula from our Example 1 of the patent application was reproduced. It contained 85% of a C11 alcohol with 3 moles of ethylene oxide, and 15% 2,4-D acid. After the addition of the 2,4-D acid to the ethoxylated alcohol, the formulation became cloudy with chunks of 2,4-D technical dispersed. After 30 minutes of stirring at ambient temperature, the formulation was clear and the 2,4-D acid was fully solubilized. The odor exhibited with this formula, is very mild, and surfactant-like. This is very uncharacteristic of other commercial 2,4-D products. The odor can be a serious problem for applications of 2,4-D in sensitive areas, where neighbors may rightly fear herbicide drift. The flash point of the formula in Example 1 was over 200 degrees F. This places Example 1 in the non-flammable category with regards to shipping and storage.

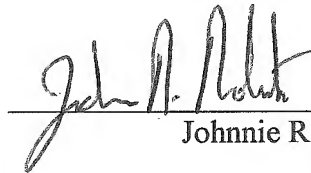
5. As in the AF-300 disclosed formula, 235 grams per liter of kerosene was added to our Example 1. The solution immediately took on the odor of kerosene. Kerosene has an objectionable odor to most people, and may indicate to many neighbors that a herbicide application has been made nearby. Their real concern is really with herbicide drift, and when chemicals odors are detected, neighbors may be rightly concerned about injury to non-target plants.

6. The flash point of the kerosene containing formulation was 128 degrees F. This would require that shipments of this formula made by air would be classified as combustible. (See attached citation from 49 CFR 173 as Appendix B. Shipments made by ground would be considered combustible. Many states have strict requirements for storage of both combustible and flammable products. This could require consumers who store this product to make expensive modifications of their storage and containment areas.

7. Photos of the formulations are provided in an attached Powerpoint presentation.
8. I hereby declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

08-29-05

Date



Johnnie R. Roberts

Curriculum Vitae

Johnnie Roberts

July 22, 2005

Current job title with Helena Chemical Company: Director of Product Development and Technical Services

Education: Bachelor of Arts Degree with a Major in Chemistry – University of Tennessee – Martin

Job experience: 30 years experience in the formulation and development of Pesticide and Spray Adjuvant Products

Professional certification: Certified Crop Consultant: (CCA) 2000 – 20005

Publications: Co-Author of 10 Scientific papers dealing with the formulation and/or application of pesticides and spray adjuvants

Inventor of Record for the following patents:

PAT. NO.	Title
<u>6,831,038</u>	<u>Agricultural formulation</u>
<u>6,541,424</u>	<u>Manufacture and use of a herbicide formulation</u>
<u>RE37,313</u>	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
<u>6,232,272</u>	<u>Manufacture and use of herbicide chlorinated phenoxy formulation</u>
<u>5,906,961</u>	<u>Alkanolamide spreader-sticker surfactant combination</u>
<u>5,877,112</u>	<u>Agricultural formulation</u>
<u>5,741,502</u>	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
<u>5,725,630</u>	<u>Dry granular fertilizer blend and a method of fertilizing plants</u>
<u>5,580,567</u>	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
<u>5,393,791</u>	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>
<u>5,234,919</u>	<u>Water soluble, highly active dimethoate formulations in an alcohol/ester solvent system</u>
<u>5,178,795</u>	<u>Homogeneous, essentially nonaqueous adjuvant compositions with buffering capability</u>

APPENDIX B

Citation from 49 CFR 173

Published 2004

Access via WWW at

<http://www.access.gpo.gov/nara/cfr/cfr-table-search.html#page1>

Sec. 173.120 Class 3--Definitions.

(a) **Flammable** liquid. For the purpose of this subchapter, a **flammable** liquid (Class 3) means a liquid having a flash point of not more than 60.5 [deg]C (141 [deg]F), or any material in a liquid phase with a flash point at or above 37.8 [deg]C (100 [deg]F) that is intentionally heated and offered for transportation or transported at or

above its flash point in a bulk packaging, with the following exceptions:

(1) Any liquid meeting one of the definitions specified in Sec. 173.115.

(2) Any mixture having one or more components with a flash point of 60.5 [deg]C (141 [deg]F) or higher, that make up at least 99 percent of the total volume of the mixture, if the mixture is not offered for transportation or transported at or above its flash point.

(3) Any liquid with a flash point greater than 35 [deg]C (95 [deg]F) that does not sustain combustion according to ASTM D 4206 (IBR, see Sec. 171.7 of this subchapter) or the procedure in appendix H of this part.

(4) Any liquid with a flash point greater than 35 [deg]C (95 [deg]F) and with a fire point greater than 100 [deg]C (212 [deg]F) according to ISO 2592 (IBR, see Sec. 171.7 of this subchapter).

(5) Any liquid with a flash point greater than 35 [deg]C (95 [deg]F) which is in a water-miscible solution with a water content of more than 90 percent by mass.

(b) Combustible liquid. (1) For the purpose of this subchapter, a combustible liquid means any liquid that does not meet the **definition** of

any other hazard class specified in this subchapter and has a flash point above 60.5 [deg]C (141 [deg]F) and below 93 [deg]C (200 [deg]F).

(2) A **flammable** liquid with a flash point at or above 38 [deg]C (100 [deg]F) that does not meet the **definition** of any other hazard class may be reclassified as a combustible liquid. This provision does not apply to transportation by vessel or aircraft, except where other means of transportation is impracticable. An elevated temperature material that meets the **definition** of a Class 3 material because it is intentionally heated and offered for transportation or transported at or above its flash point may not be reclassified as a combustible liquid.

(3) A combustible liquid that does not sustain combustion is not subject to the requirements of this subchapter as a combustible liquid. Either the test method specified in ASTM D 4206 or the procedure in appendix H of this part may be used to determine if a material sustains

combustion when heated under test conditions and exposed to an external source of flame.

(c) Flash point. (1) Flash point means the minimum temperature at which a liquid gives off vapor within a test vessel in sufficient concentration to form an ignitable mixture with air near the surface of the liquid. It shall be determined as follows:

(i) For a homogeneous, single-phase, liquid having a viscosity less than 45 S.U.S. at 38 [deg]C (100 [deg]F) that does not form a surface film while under test, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Tag Closed Tester, (ASTM D 56);

(B) Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester, (ASTM D 3278); or

(C) Standard Test Methods for Flash Point by Small Scale Closed Tester, (ASTM D 3828).

(ii) For a liquid other than one meeting all of the criteria of paragraph (c)(1)(i) of this section, one of the following test procedures shall be used:

(A) Standard Method of Test for Flash Point by Pensky--Martens Closed Tester, (ASTM D 93). For cutback asphalt, use Method B of ASTM D 93 or alternate tests authorized in this standard; or

(B) Standard Methods of Test for Flash Point of Liquids by Setaflash Closed Tester (ASTM D 3278).

(2) For a liquid that is a mixture of compounds that have different volatility and flash points, its flash point shall be determined as specified in

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paragraph (c)(1) of this section, on the material in the form in which it is to be shipped. If it is determined by this test that the flash point is higher than -7 [deg]C (20 [deg]F) a second test shall be made as follows: a portion of the mixture shall be placed in an open beaker (or similar container) of such dimensions that the height of the liquid can be adjusted so that the ratio of the volume of the liquid to the exposed surface area is 6 to one. The liquid shall be allowed to evaporate under ambient pressure and temperature (20 to 25 [deg]C (68 to

77 [deg]F)) for a period of 4 hours or until 10 percent by volume has evaporated, whichever comes first. A flash point is then run on a portion of the liquid remaining in the evaporation container and the lower of the two flash points shall be the flash point of the material.

(3) For flash point determinations by Setaflash closed tester, the glass syringe specified need not be used as the method of measurement of the test sample if a minimum quantity of 2 mL (0.1 ounce) is assured in the test cup.

(d) If experience or other data indicate that the hazard of a material is greater or less than indicated by the criteria specified in paragraphs (a) and (b) of this section, the Associate Administrator may revise the classification or make the material subject or not subject to the requirements of parts 170-189 of this subchapter.

[Amdt. 173-224, 55 FR 52634 Dec. 21, 1990, as amended by Amdt. 173-227, 56 FR 49989, Oct. 2, 1991; 56 FR 66268, Dec. 20, 1991; 57 FR 45461, Oct.

1, 1992; Amdt. 173-241, 59 FR 67506, 67507, Dec. 29, 1994; Amdt. 173-255, 61 FR 50625, Sept. 26, 1996; Amdt. 173-261, 62 FR 24731, May 6, 1997; 66 FR 45379, 45381, Aug. 28, 2001; 68 FR 75743, Dec. 31, 2003]

APPENDIX C



Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM
 Product Name: AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

COMPANY DETAILS

Company Name NUFARM AUSTRALIA LIMITED. (ABN 80 004 377 780)
 Address 103-105 Pipe Road Laverton North
 Victoria 3026 Australia
 Emergency Tel. 24hr 1800 033 498
 Tel/Fax Tel: (03) 9282-1000 Fax: (03) 9282-1001
 Other Information

IDENTIFICATION

Product Code 0027
 Product Name AF300 Herbicide
 Proper Shipping Name FLAMMABLE LIQUIDS, N.O.S. - (2,4-dichlorophenoxyacetic acid/kerosine)
 UN Number 1993
 DG Class 3
 Packing Group III
 Hazchem Code 2Y
 Poisons Schedule S5
 Product Use For the integrated control of Groundsel bush, Mother-of-millions, Noogoora burr, Bathurst burr and water hyacinth and other weeds as listed in the Directions for Use Table.

Physical Data

Appearance Light straw coloured limid liquid with typical hydrocarbon odour.
 Melting Point <0°C
 Boiling Point >160°C (for solvent)
 Vapour Pressure Active ingredient considered non-volatile
 Specific Gravity 1.03 - 1.05 (1.044)
 Flash Point 40°C
 Flamm. Limit LEL No information available

Other Properties

Volatile Component -23%
 Autoignition Temp. No information available
 Vapour Density No information available
 Form Liquid
 Other Information Emulsifies in water.

Ingredients

Ingredients	Name	CAS	Proportion
	2,4-Dichlorophenoxy acetic acid	94-75-7	300 g/L
	Synthetic ethoxylated alcohol	68439-46-3	50 %
	Solvent 400		235 g/L

HEALTH HAZARD INFORMATION

Health Effects

Acute - Swallowed A significant hazard exists if the concentrate is accidentally swallowed. Absorption of relatively large amounts of 2,4-D can produce headaches, nausea, lethargy, motor weakness and inco-ordination. The concentrate is considered harmful if swallowed, when classified according to the Worksafe Criteria.



Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM
 Product Name: AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

Acute - Eye The concentrate is irritating to the eyes. No permanent effects on the eyes is expected from a single exposure

Acute - Skin The concentrate is irritating to the skin. Prolonged or repeated exposure may cause defatting of the skin which could lead to secondary dermatitis. Some absorption of 2,4-D acid is possible if contact with the concentrate is prolonged.

Acute - Inhaled Inhalation of solvent may lead to headache or nausea if exposure is prolonged. Avoid breathing spray mists.

Chronic Chronic Over Exposure: Repeated absorption of relatively large doses of 2,4-D presents a risk to the liver and kidneys.

Other Information If poisoning occurs, contact a Doctor or Poisons Information Centre 13 11 26

First Aid

Swallowed If swallowed do NOT induce vomiting; seek medical advice immediately and show this container or label or contact the Poisons Information Centre on 13 11 26. Make every effort to prevent vomit from entering the lungs by careful placement of the patient.
 The above first aid instructions are mandated by the Commonwealth Department of Health and Aged Care via the National Drugs and Poisons Schedule. These instructions are suitable for ingestion of spray solution and small amounts of concentrate; however, if SUBSTANTIAL AMOUNTS of the concentrate have been swallowed (more than about 50ml) AND if medical assistance is more than 30 minutes away, the induction of vomiting should be CONSIDERED, preferably based on MEDICAL ADVICE if a physician can be contacted by phone. All care must be taken to prevent vomit from being inhaled. Do not give anything by mouth to a semi-conscious or unconscious person.

Eye Immediately irrigate with copious quantity of water for at least 15 minutes. Eyelids to be held open.

Skin Wash affected areas thoroughly with soap and water.
 Remove contaminated clothing and launder before re-use.

Inhaled Remove victim to fresh air until recovered.

Advice to Doctor

Advice to Doctor Treat symptomatically.
 Aspiration of vomitus may lead to pulmonary pneumonitis, which may be serious, especially in young children.

Other Health Hazard Information**PRECAUTIONS FOR USE**

Exposure Limits No exposure limits have been set for this product, however, an exposure limit has been set for 2,4-D acid (solid) at 10 mg/m³

Eng. Controls Handle the concentrate in a well ventilated space. Natural ventilation is adequate, although a local exhaust should be provided if material is handled in confined spaces.

Personal Protection

Protective Equip. Avoid contact with eyes and skin. DO NOT inhale spray mist. When preparing spray wear PVC or rubber apron, elbow-length PVC gloves and face shield. When using the prepared spray wear face shield. If product on skin, immediately wash area with soap and water. After use and before eating, drinking and smoking, wash hands, arms and face thoroughly with soap and water. After each day's use, wash gloves, face shield and contaminated clothing.

Flammability



Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM
 Product Name: AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

Fire Hazards Flammable 40°C (Abel L.C.) for solvent present.

SAFE HANDLING INFORMATION

Storage and Transport

Storage and Transport Details:

Proper Shipping Name:
 Flammable liquid, n.o.s. (2,4-dichlorophenoxyacetic acid)
 UN No. 1993 Class: 3
 Packaging Group: III Hazchem: 2Y
 FLAMMABLE
 Avoid all sources of ignition including static electricity buildup during transfer operations.
 Store in original container, tightly sealed, in a safe place away from seeds, fungicidal and insecticidal sprays or fertilizers.
 Proper Shipping Name: FLAMMABLE LIQUIDS, N.O.S. - (2,4-dichlorophenoxyacetic acid/kerosine)
 EPG Number 3A1

Spills and Disposal

Spills & Disposal Contain spill and absorb with sand or proprietary absorbent (vermiculite).
 Prevent from entering drains, waterways or sewers.
 Collect in sealed open top containers for disposal.
 Triple rinse containers, add rinsate to the spray tank, then offer container for recycling/reconditioning, or puncture top, sides and bottom and dispose of in landfill in accordance with local regulations. On-site disposal of concentrate is not acceptable.

Fire/Explosion Hazard

Fire/Explos. Hazard Extinguishing Media: Water fog, dry chemical, foam, CO2.
 Special Fire Fighting Procedures: Breathable air apparatus may have to be worn if material is involved in fires especially in confined spaces.
 Keep upwind.
 Unusual Fire and Exposure Hazard: May emit toxic fumes of hydrogen chloride, phosgene and carbon monoxide if material is involved in fires or subjected to extreme heat.
 Hazardous Reaction Store away from oxidising agents, may react violently with strong oxidising agents.
 Polymerisation is not possible.
 Hazchem Code 2Y

OTHER INFORMATION



Material Safety Data Sheet

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Infosafe No. NU003 Issue Date: January 2002 ISSUED by NUFARM
 Product Name: AF300 Herbicide

Classified as hazardous according to criteria of NOHSC

Toxicology 2,4-D (2,4-dichlorophenoxyacetic acid)
 LD50 (oral, rat): 699mg/Kg
 LD50 (dermal, rabbit): >2,000mg/Kg
 LC50 (inhalation, rat): >1.79mg/L (4hr) (maximum attainable concentration)
 Not toxic to bees
 LC50 (rainbow trout): ~100mg/L
 LC50 (daphnia): 1.4mg/L
 LC50 (mallard duck): >5,000mg/Kg diet
 In trials using 2,4-D as a drug, studies on volunteers have shown that doses of between 5 and 36mg/Kg body weight do not cause any acute toxic effects. Formulated 2,4-D products can be absorbed by ingestion, inhalation (spray mist) and through the skin. Studies of users (sprayers) has shown that absorption through the skin is the most common route. When used with good agricultural spraying practice and good personal hygiene, absorption of 2,4-D is very low.
 2,4-D does not accumulate in the body; a single dose of 2,4-D is rapidly excreted (in a few days), mainly in the urine.
 The Australian Acceptable Daily Intake (ADI) of 2,4-D for a human is 0.01mg/kg/day, set for the public for daily, lifetime exposure. This is based on the NOEL of 1.0mg/kg/day, the level determined to show no effects during long term exposure for the most sensitive indicators and the most sensitive species. (Ref: Comm. Dept. of Health and Aged Care, 'ADI List', TGA, August 2001).

Environ. Protection 2,4-D products do not appear to pose any threat to birds.
 2,4-D products do not appear to pose any threat to fish other than in very high concentrations.
 DO NOT spray in high winds. Do not contaminate dams, waterways or streams with this product or used containers. DO NOT use this container for any other purpose. After use, triple rinse containers, add rinsate to the spray tank, then offer container for recycling/reconditioning, or puncture top, sides and bottom and dispose of in landfill in accordance with local regulations. On-site disposal of concentrate is not acceptable.
 Equipment that has been used for this product should not be used for the application of other materials to sensitive plants, unless it has been well washed out with hot, soapy water or 1% ammonia solution, followed by several clear water rinses.
 Do not use on or in situations where damage to susceptible crop plants such as cotton, tobacco, tomatoes, flowers, vines fruit trees or other susceptible crop plants may result from direct application or spray drift.



Material Safety Data Sheet

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Infosafe No.	NU003	Issue Date:	January 2002	ISSUED by	NUFARM
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Product Name : AF300 Herbicide


Classified as hazardous according to criteria of NOHSC

Pkg. & Labelling	<p>WARNING</p> <p>KEEP OUT OF REACH OF CHILDREN</p> <p>READ SAFETY DIRECTIONS BEFORE OPENING</p> <p>Not to be used for any purpose or in any manner contrary to the label unless authorised under appropriate legislation.</p> <p>The product has been assessed according to the Worksafe criteria for classifying hazardous substances and is classified as hazardous:</p> <p>Risk Phrases:</p> <p>R10 Flammable</p> <p>R22 Harmful if swallowed</p> <p>R36/37/38 Irritating to eyes, respiratory system and skin</p> <p>R65 Harmful: may cause lung damage if swallowed</p> <p>Safety Phrases:</p> <p>S2 Keep out of reach of children</p> <p>S23 Do not breathe vapour</p> <p>S24 Avoid contact with skin</p> <p>S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice</p> <p>S36/37 Wear suitable protective clothing and gloves</p> <p>S62 If swallowed, do not induce vomiting; seek medical advice immediately and show this container or label. Refer to First Aid section.</p>
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CONTACT POINT



Contact	<p>Normal Hours: Mr Volker Maier</p> <p>After Hours: Shift Supervisor</p> <p>...End Of MSDS...</p>	<p>Phone: (03) 9282 1000</p> <p>Phone: 1800 033 498</p>
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APPENDIX 2



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C9-11 Pareth-3
RN: 68439-46-3

Name of Substance

- ☐ C9-11 Pareth-3
- ☐ C9-11 Pareth-6
- ☐ C9-11 Pareth-8
- ☐ Pareth-91-3
- ☐ Pareth-91-6
- ☐ Pareth-91-8

Synonyms

- ☐ (C9-C11) Alkyl alcohol, ethoxylate
- ☐ (C9-C11) Alkyl alcohol ethoxylate
- ☐ Neodol 91-6
- ☐ Polyethylene glycol, nonyl, decyl, undecyl ether

Systematic Name

- ☐ Alcohols, C9-11, ethoxylated
- ☐ Alkyl(C9-11) alcohol, ethoxylated

Superlist Name

- ☐ Alcohols, C9-11, ethoxylated

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